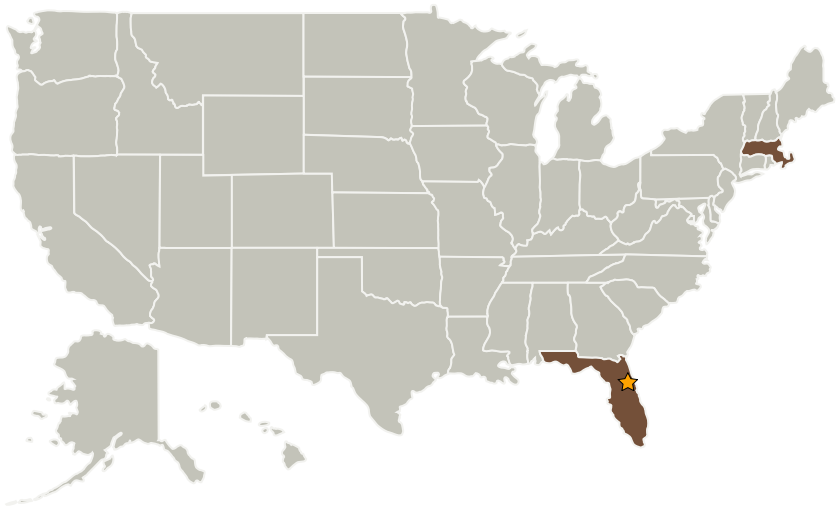
Aerogel Insulation to Support Cryogenic Technologies, Phase I

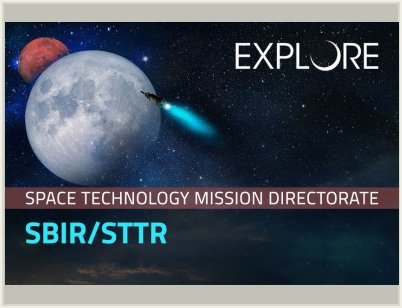
Completed Technology Project (2005 - 2005)

Project Introduction

NASA strives to make space travel safer, faster, and cheaper, expanding our horizons for a new generation of space exploration and colonization. This cannot be accomplished solely through improvements in the launch vehicle; the launch site and ground control systems must be equally enhanced. The next generation cryogenic propellant storage and distribution system must integrate an efficient overall structure and layout of the launch site. Many of the components in propellant distribution systems can be complex and require an insulation that can be formed to these irregular shapes. Aspen Aerogels bead technology can provide NASA with a solution. Aerogel beads are configurable to virtually any shape and offer a lightweight viable insulation solution with substantial improvements over conventional insulations such as superior thermal performance at moderate vacuum levels. As an improvement over silica aerogel, Aspen proposes the use of higher strength and more resilient organically modified aerogel beads to insulate cryogenic pipeline applications. During the proposed effort we will investigate two types of materials for the generation of clamshell type insulation with far superior thermal insulation properties; aerogel beads held together with a binder, and novel self-adhesional aerogel beads, both encapsulated in evacuated vacuum panels.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Kennedy Space Center (KSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Kennedy Space Center(KSC)	Lead Organization	NASA Center	Kennedy Space Center, Florida
Aspen Aerogels, Inc.	Supporting Organization	Industry	Northborough, Massachusetts

Primary U.S. Work Locations	
Florida	Massachusetts

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Shannon White

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.1 Cryogenic Systems
    - TX14.1.1 In-space Propellant Storage & Utilization